UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF HOME ECONOMICS
WASHINGTON, D. C.

Wheat Germ Has High Nutritive Value

The germ is the most nutritious part of the wheat kernel. It is rich in fat and is known to be a good source of vitamin A and an excellent one of vitamins B, G, and E. Although this portion of the grain has an excellent flavor it is seldom used as human food except in the whole wheat products which contain only a very small percentage of germ.

In order to demonstrate the practical use of wheat germ as a source of vitamin G, a dietary study has been made by the Bureau of Home Economics in a county in South Carolina where pellagra is prevalent. Wheat germ was furnished several families for a period of about five months as a supplement to the regular diet. At the end of the study the general appearance and health of these families had improved and the incidence of the pellagra was much less than would have been expected from their previous history.

In the milling process the germs are flattened and separated as yellowish, oily flakes. Unfortunately this germ meal as it is called does not keep well, so it has been difficult to handle it commercially as human food. Studies are now under way to develop some method of treatment which will make it keep better so that it can be sold on the retail market. In the meantime, it can often be obtained direct from the mills in wholesale quantities and agricultural extension workers in some State have made arrangements for its distribution to consumers in small packages.

In order to meet various requests for data on composition of wheat germ the Bureau of Chemistry and Soils has made chemical analyses of six samples. The samples came from mills in various wheat-growing centers and were chosen from a larger number collected by this bureau and the Bureau of Agricultural Economics. These have been summarized together with analyses from several other sources to indicate the average proximate composition of wheat germ meal.

Recipes Using Wheat Germ

The following recipes have been worked out and tested in this bureau, using the mill product. Since fresh milk is not easily obtained in some of the communities where foods rich in vitamin G are most needed, it is suggested that water may be substituted for the milk if necessary. Using evaporated milk or milk powder diluted to the strength of fresh milk is of course preferable from the nutritive standpoint to using water alone in any of these recipes. One-fourth of a cup of milk powder diluted with one cup of water makes a satisfactory substitute for slightly more than one cup of fresh milk. For convenience, the powder may be mixed with the other dry ingredients and the water added later.

Wheat Germ Biscuit

2 cups wheat flour
1 teaspoon salt
5 teaspoons baking powder
1 cup wheat germ
3 tablespoons shortening
7/8 to 1 cup milk

Sift the salt and baking powder with the flour, and stir in wheat germ. Cut or rub in the shortening. Add the milk gradually and mix with a fork to form a soft dough. Place on a floured board and pat or roll lightly to about 3/4 inch thickness. Cut into small rounds and bake 12 to 15 minutes in a hot oven (400° to 430°F.) Serves 5 to 6.

Wheat Germ Yeast Bread

1 cup milk
1 cake compressed yeast
1-1/2 teaspoons salt
1 tablespoon sugar
1 tablespoon fat
3 cups wheat flour
1 cup wheat germ

Scald the milk and pour all but a small portion of it over the sugar, salt, and fat. When the remaining milk has cooled to lukewarm, soften the yeast in it and add to the first mixture. Stir the flour and wheat germ together, add gradually to the liquid mixture until a moderately stiff dough is formed, and knead. Let rise until double in bulk. Punch down or knead lightly. When bulk is doubled again, form into a loaf, let rise until again doubled, and bake 35 to 40 minutes in a moderately hot oven (350°F.) Makes one loaf.

Variation: Add to the above ingredients 2 or 3 tablespoons milk powder mixed to a paste with 2 tablespoons water.

Wheat Germ Skillet Bread

1 cup wheat germ
1 cup corn meal
1¾ cups water
2 tablespoons lard or bacon fat
1 teaspoon salt

Mix the dry ingredients and add the water. Melt the fat, save out enough for frying and pour the remainder into the batter. Bake on a skillet over the fire, turning to brown both sides.

Variation: Add ¼ cup of milk powder to the dry ingredients.

Wheat Germ Spoon Bread

2/3 cup white corn meal
1/3 cup wheat germ
2 cups boiling water
1 teaspoon salt
1 cup milk
2 eggs *
2 tablespoons shortening

Stir the corn meal and wheat germ slowly into the boiling salted water, lower the flame, and cook for 7 to 8 minutes, stirring constantly; or place in a double boiler and cook for 15 minutes. Remove from heat and add the milk, the well-beaten eggs, and the shortening. Mix well, pour into a greased baking dish, bake for 35 minutes in a moderately hot oven (400° F.), then increase the temperature to 425° F. for 10 minutes to brown. Serve from the baking dish. Serves 5 to 6.

* Variation: To reduce the cost the eggs may be omitted, in which case 1½ to 2 cups of total liquid instead of 3 cups will be enough.

Corn Meal and Wheat Germ Bread

1 cup wheat germ
1 cup corn meal
1 tablespoon sugar
1 teaspoon salt
3 teaspoons baking powder
1 egg
1-1/2 cups milk
2 tablespoons melted shortening

Mix the dry ingredients together. Beat the egg, add the milk, and stir into the dry mixture. Add the melted shortening and beat well. Pour into a well-greased pan and bake about 40 minutes in a hot oven (400° F. to 425° F.). Serves 5 to 6.

Variations: Sour milk may be substituted for the sweet milk and 3/4 teaspoon soda for the baking powder.

Three to four tablespoons of milk powder with enough water to make a paste may be added to this recipe.

The proportion of wheat germ to corn meal may be changed, as 1-1/3 cups corn meal and2/3 cup wheat germ.

Wheat Germ Brown Bread

1 cup wheat germ
1 cup corn meal
1 cup wheat flour
1 teaspoon salt
1 teaspoon soda
3/4 cup molasses
1 egg
1-1/4 cups sour milk

Mix the dry ingredients, add the molasses, beaten egg, and sour milk. Beat the mixture well. Pour into small greased tin cans until about three-quarters full. Cover and steam for 3-1/2 hours. Remove covers and bake the bread one-half hour in a moderate oven (350° to 375° F.) to dry out. Makes 3 small loaves.

Variations: Use sweet milk instead of sour and substitute 4 teaspoons baking powder for the soda.

Sorghum or sugar cane sirup may be used instead of molasses.

Wheat Germ Gingerbread

1-2/3 cups wheat flour
1/2 teaspoon salt
2 teaspoons baking powder
3/4 to 1 teaspoon soda
2 teaspoons ginger
1 teaspoon cinnamon
3/4 cup wheat germ
1 cup molasses
1/3 cup butter
1/2 cup buttermilk
1 egg
2 tablespoons sugar

Sift together the flour, salt, baking powder, soda, and spices, and stir in the wheat germ. Heat the molasses and butter. When cool add the buttermilk, well-beaten egg, and sugar, and combine with the dry ingredients. When the batter is well mixed, beat for 3 minutes with a wire egg whip, pour into a greased shallow pan or muffin tins, and bake in a moderate oven (350° to 375° F) about 40 minutes. Serves 5 to 6.

Wheat Germ Drop Cookies

1/2 cup butter
1 cup sugar
1/4 cup milk
2 eggs
2 to 2-1/2 cups wheat flour
1/2 cup wheat germ
2 teaspoons baking powder
2 teaspoons nutmeg

Cream butter, and add the sugar gradually. Add the milk and beaten eggs, then stir in dry ingredients and beat well. Drop by teaspoonfuls on a greased baking sheet. Bake for about 12 minutes, the first 5 minutes in a moderately hot oven (350° F.) then in a slow oven (300° to 325° F.). Makes about 3 dozen cookies.

Wheat Germ Honey Cookies

3/4 cup honey
1/4 cup butter
1 egg
1/2 teaspoon soda
1/2 teaspoon salt
1/2 teaspoon cloves
1/2 teaspoon cinnamon
2-1/4 cups wheat flour
1 cup wheat germ
1 cup raisins

Heat the honey and mix with the butter. Cool and add the beaten egg. Stir in the dry ingredients and raisins, and beat well. Drop by teaspoonfuls on a greased baking sheet. Bake in a moderately hot oven (350°F.) for the first few minutes so the cookies will hold shape, then lower the oven heat to about 300° to 325°F., and bake for about 8 minutes longer. Makes about 2 dozen cookies.

The quantity of wheat flour may have to be varied with different consistencies of honey.

Wheat Germ Chocolate Pudding

2/3 cup white corn meal
1/3 cup wheat germ
1 teaspoon salt
3 cups milk
2 eggs
2 tablespoons butter
2 squares unsweetened chocolate, melted.
1 cup sugar
1 teaspoon vanilla

Stir the corn meal, wheat germ, and salt into the milk, and cook in a double boiler for 5 minutes. Pour this mixture slowly into the well-beaten eggs. Add the butter, chocolate, sugar, and vanilla, pour into a greased baking dish, and bake about 35 minutes in a moderately hot oven (370° to 380°F.). Serve with cream, or lemon sauce. Serves 5 to 6.

U. S. BUREAU OF HOME ECONOMICS
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WHEAT GERM Proximate composition of wheat germ meal from mills in various wheat growing areas 1/

Sources	Sample	Milled	Appearance: Comparison of 6 samples, proportion of: Bran	Appearance: Comparison of 6 samples, proportion of: Flour	Water	Protein (N x 6.25)	Fat as ether extract	Carbohydrates: Total by difference 2/	Carbohydrates: Crude fiber	Total ash	Fuel value per pound
					%	%	%	%	%	%	Cals.
U. S. Dept. of Agr. 1929	1	Spokane	Medium	Highest	10.6	22.6	8.2	55.2	2.7	3.35	1746
	2	Kansas City	High	Medium	10.2	24.4	8.4	52.4	3.2	4.64	1736
	3	Minneapolis	Low	Low	11.0	29.6	12.6	42.7	1.8	4.14	1826
	4	Louisville	Highest	Low	10.9	26.2	9.6	48.8	3.0	4.52	1753
	5	Kansas City	Lowest	Lowest	11.0	31.3	10.4	42.6	2.0	4.74	1765
	6	Minneapolis	Medium	Low	12.0	28.9	10.8	44.2	2.3	4.14	1767
	Av.				11.0	27.2	10.0	47.5	2.5	4.26	1764
	No.				(6)	(6)	(6)	(6)	(6)	(6)	
	Av.				9.6	30.3	11.9	43.6	2.0	4.65	1827
Others 3/	No.				(11)	(11)	(11)	(11)	(6)	(11)	
All	Av.				10.1	29.2	11.2	45.0	2.3	4.51	1804
	Max.				13.9	39.6	15.6	55.2	3.2	5.45	
	Min.				6.8	22.6	8.2	34.6	1.5	3.35	
	No.				(17)	(17)	(17)	(17)	(12)	(17)	

1/ Original analyses were made by the Bureau of Chemistry and Soils on samples submitted by the Bureau of Home Economics

2/ Including fiber

3/ Published and unpublished analyses from various sources. One or more samples of hand-separated germ